WESTON®

Book II

MODEL 1230
DIGITAL PANEL METER

INSTRUCTIONS/PARTS LIST

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FOR MODEL 1230

DIGITAL PANEL METER

U.S. Patent 3,051,939
and Patents Pending

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INTRODUCTION

The Weston Model 1230 Digital Panel Meter is a miniature, single range, 3½ digit bi-polar, high input impedance instrument designed to indicate input DC voltage or current in one of 10 possible ranges. Full scale is 1000 digits with overrange capability to 1999 except the 1000 volt DC full scale range. An out-of-range condition is indicated by turning on the leading one digit with all other digits blanked. A minus (-) indicator is provided for negative polarity input signals.

The case front has an amber glare reduction filter. Zero adjustment is automatic. A single control for full scale adjustment is made accessible by removing the case front.

Figure 1 shows the pictorial view and overall dimensions of the meter.

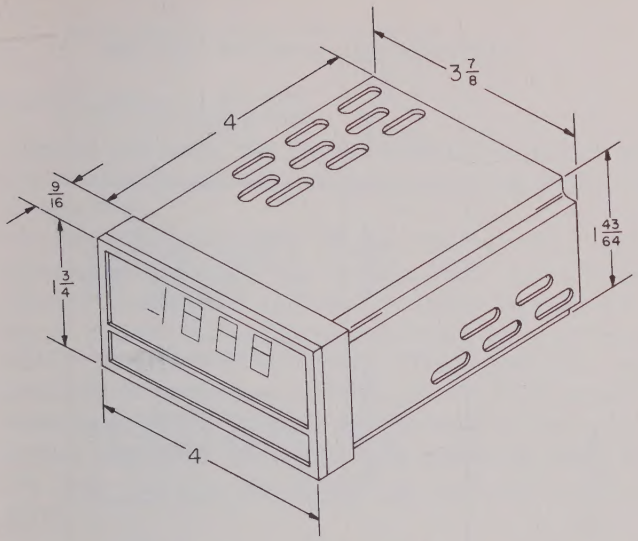


Figure 1. Outline Dimensional Drawing

SPECIFICATIONS

Minimum Range	00.0 to 100.0m VDC
Overrange	100% (except for 1000V range)
Rated Accuracy	±0.1% of reading ±1 digit
Input Resistance	100MΩ (See Table 1)
Bias Current	2nA max. 0.7nA typical
Common Mode Rejection Ratio	80dB with 1000 ohm unbalance at 60Hz
Normal Mode Rejection Ratio	25dB at 60Hz (10dB for 1 volt Range)
Speed	7.5 readings per second
Response Time	1 second
Maximum Voltage Overload	60VDC (100m V range) See Table 1
Stability	±0.1% full scale
Power	117V nominal 105V to 125V 50Hz to 60Hz 4.7 Watts
Weight	Approx. 13 ounces
Operating Temperature	0°C to 50°C
Storage Temperature	-40°C to 70°C
Temperature Coefficient	of zero ±25 ppm/°C of full scale ±100 ppm/°C
BCD Output (Optional)	2 TTL Load

TABLE 1.
TABLE OF SPECIFICATIONS

PART NO. 117VAC	PART NO. 117VAC WITH BDC	RANGE	SENSITIVITY	INPUT IMPEDANCE	FULL SCALE	MAXIMUM VOLTAGE OVERLOAD
274871	274900	100mV	0.1mV	100M Ω	100.0	60V
274872	274901	1V	0.001V	100M Ω	1.000	60V
274873	274902	10V	0.01V	5M Ω	10.00	1000V
274874	274903	100V	0.1V	5M Ω	100.0	1000V
274875	274904	1000V	1V	5M Ω	1000	1100V
274876	274905	10uA	0.01uA	10K Ω	10.00	—
274877	274906	100uA	0.1uA	1K Ω	100.0	—
274878	274907	1mA	0.001mA	100 Ω	1.000	—
274879	274908	10mA	0.01mA	10 Ω	10.00	—
274880	274909	100mA	0.1mA	1 Ω	100.0	—

INSTALLATION – MECHANICAL

Panel Mounting

1. Unpack the meter and perform a visual inspection to assure that no damage has occurred during shipment or handling.
2. Remove front assembly. Rotate the four mounting screws (located in the four inner corners) 3 or 4 times counterclockwise to position the mounting cams correctly. Mount the main assembly (see Figure 2) on a panel 1/16 to 1/8 inch thick. The panel shall be prepared in accordance with the panel cut-out dimensions as shown in Figure 3. Rotate the four mounting screws clockwise to position the mounting cams in the lock position and secure the instrument to the panel.

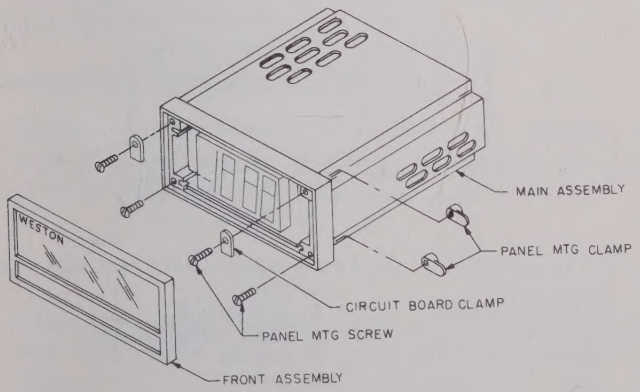


Figure 2. Meter Mounting Drawing

3. The front assembly can be secured into position at this time. This front assembly will have to be removed to adjust and calibrate the meter.

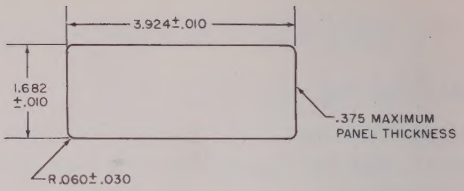
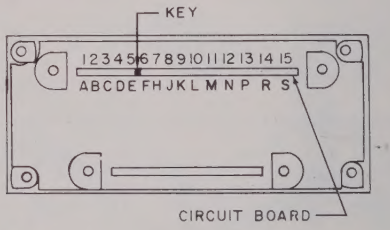


Figure 3. Panel Cut-Out Dimensions

INSTALLATION – ELECTRICAL

The Digital Panel Meter has provisions to accept a connector at the rear of the case. A connector package is supplied as an accessory under Weston Part Number 267253-901. It consists of a connector ELCO no. 00-6007-030-980-002 and two screws No. 4-40 thd x 1/2 inch long, binding head.



1. EXTERNAL REF.
2. SIGNAL INPUT
3. PRINT COMMAND
4. POLARITY
5. BCD 8
6. BCD 2
7. BCD 80
8. BCD 20
9. BCD 800
10. SIGNAL GND
11. BCD 400
12. BCD 200
13. SPARE
14. BCD 1000
15. 117/234 VAC LINE 1

A. SIGNAL INPUT 10V, 100V, 1000V
B. SPARE
C. OUTRANGE
D. HOLD (Open Collector)
E. BCD 1
F. BCD 4
H. BCD 10
J. BCD 40
K. BCD 100
L. DP 3
M. DP 2
N. DIGITAL GND, BCD GND
P. DP 1
R. SHIELD
S. 117/234 VAC LINE 2

Figure 4. Rear View of Pin Designation

ELECTRICAL INPUTS

Hold

A transistor switch or an open collector TTL microcircuit connected to the hold terminal (Pin D) can be used to keep the voltage level low and defeat the synchronizing signal applied to the synchronizing divider. This will prevent the generation of a reset pulse. In application, the signal to this terminal should be free of contact bounce or any spurious spike signals. Resistance — capacitance filtering may be required for noisy sources.

External Reference

An external reference may be used for ratio operation. The reference should be of positive polarity and may change ±20% without degrading accuracy. Disconnect pads C and D to minimize loading.

Remote Decimal Point

External connection of a 47,000 ohm resistor to ground may be used to program the decimal point to any one of the three positions.

OPERATION

1. After the meter has been panel mounted, connect a 117 volt single phase 50Hz or 60Hz power line as follows:
   a. One side of AC line to Pin 15
   b. Other side of AC line to Pin S
   c. Earth ground to Pin R
2. Allow meter to warm up for 15 minutes.
3. Remove front assembly.
4. Short signal input pins and meter should read zero with polarity lamp either off, on, or blinking.

5. Remove short and apply a standard source to the signal input pins. Apply full scale signal and rotate potentiometer at left end of display until meter reads 1000 ±1 digit. Reverse signal polarity and check for reading of 1000.
6. Full scale digital presentation is tabulated in Table 1. However, the meter can OVERRANGE an additional 999 digits for either polarity. If a larger signal is applied only the leading one digit will illuminate and the remaining three digits will be blanked out in this OUT-OF-RANGE condition.
7. Selection of the decimal point is accomplished by shorting a solder bridge on the display board. The bridges are numbered 1 through 3 (See Figure 5) referred to the spaces between digits from left to right.

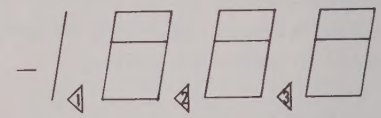


Figure 5. Selection of Decimal Point

8. Table 2 is an example of display indication for a one volt range meter.

TABLE 2.
DISPLAY FOR A 1 VOLT RANGE

APPLIED SIGNAL VOLTAGE	INDICATION
+2.000 & higher	1.
+ .000 to 1.999	.000 to 1.999
- .000 to -1.999	- .000 to -1.999
-2.000 & higher	-1.

9. Some meters are equipped with a zero adjustment potentiometer which is normally factory set. For applications where a fixed offset is desired, and the adjustment is accessible through a slot on the left side of the case, near the back.

THEORY OF OPERATION

General

The instrument utilizes a dual slope integrating technique which converts the input signal into a ratio of two time intervals, both proportional to clock period, making the accuracy of conversion independent of clock accuracy, and independent of integrator time constant drift. Refer to Figure 6 Block Diagram. Conversion begins with a reset pulse from the SYNC DIVIDER which resets the decade counters, turns on the 300kHz OSCILLATOR for 3.33 milliseconds and applies the

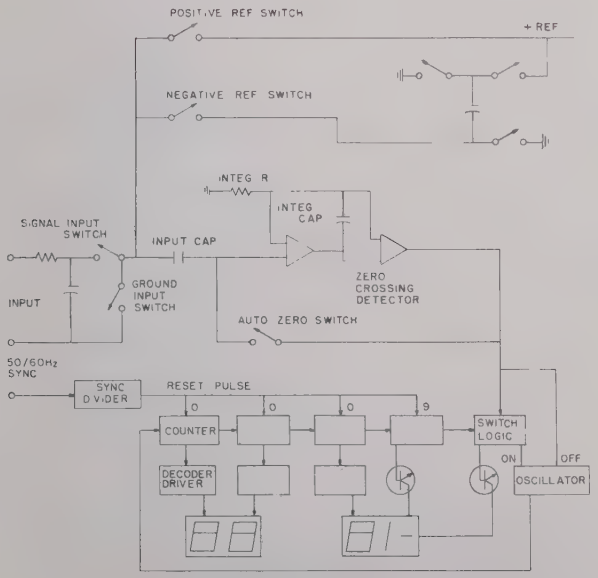


Figure 6. Block Diagram

input signal through the SIGNAL INPUT SWITCH and the INPUT CAPACITOR to the INTEGRATOR AMPLIFIER. The output of the integrator, at this time, is of the same polarity as the input signal. This polarity is sensed by the zero crossing detector and causes a reference switch of opposite polarity to close, effecting a discharge of the integrating capacitor to a zero level at which time the ZERO CROSSING DETECTOR turns off the OSCILLATOR, and leaves the counters set to a BCD number representing the input signal. The BCD number is decoded into a seven segment form and actuates current source drivers which light up the segments of a seven-bar gas-discharge display tube.

Waveforms (Ref Figure 7)

The integrating cycle is divided into two intervals, signal ramp up T_1 and reference ramp down T_2. During T_1 the integrator charges to a voltage $\frac{e_{in}\, T_1}{RC}$.

During T_2 the discharge voltage is $\frac{e_{ref}\, T_2}{RC}$

Equating these voltages $T_2 = \frac{e_{in}}{e_{ref}} \quad T_1$

Since the frequency of the clock is the same for intervals T_2 and T_1, the number of pulses occurring during these intervals will be in similar ratio

$$N_2 = \frac{e_{in}}{e_{ref}} \times N_1$$

By making $N_1 = 1000$ $\qquad N_2 = \frac{1000}{e_{ref}} \times e_{in}$

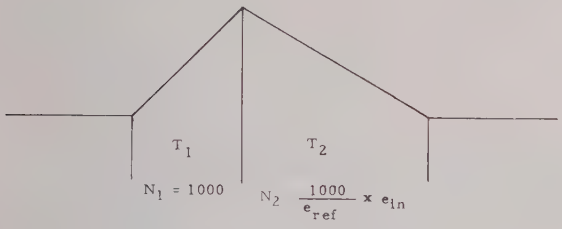


Figure 7. Integrator Output Voltage for e_{in} Positive

Display (Ref Figure 8)

The integrating period T_1 is started at the time t_o that the line voltage passes through zero in the negative going direction. During the periods T_1 and T_2 the anode supply for the display tubes tends to be of negative polarity but is blocked by diode CR 101 so that the voltage is nearly zero and the display is blanked. When the counters have reached a number N_2 proportional to e_{in} the anode voltage may already be positive but not of sufficient magnitude to cause conduction t_2. A short time later t_3 conduction is initiated and still later t_4 is limited in magnitude by the current driver circuits.

The anode current is thus seen to flow in pulses with the integrating or converting period timed to occur during blanking so as to avoid a blurred or flickering display.

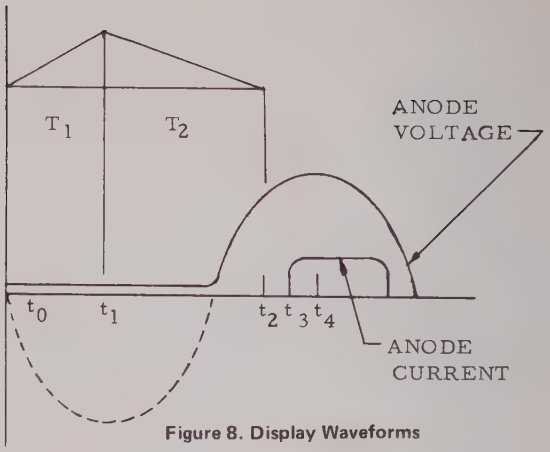


Figure 8. Display Waveforms

Switch Logic

Reset

Sync divider U107 receives signals of line frequency via divider R119 and R136. When the eighth negative going signal is received, the D output pin 11 goes positive generating a reset signal for decade counters U106, U109, U110, and U111. R140 and C110 act as a 1 microsecond delay network so the reset pulse terminates itself after that interval by resetting U107 via pin 2.

Polarity

Polarity FF - Switch Counter U106 is preset to state 9 by the reset signal applied to pin 6. Output A pin 12 is set high corresponding to negative polarity. Output B and C are low and output D pin 11 is set high corresponding to the signal integrate command. When C is low and D is high the oscillator is enabled and the first part of the conversion cycle proceeds for 1000 clock pulses to integrate the input signal.

The oscillator is enabled by C low to U112 pin 9 which inverts and has pin 8 high which applied to pin 4 of U108 enables that gage of the oscillator. The other necessary signal results from D high which is applied to U112 pin 11 which inverts and has pin 10 low which sets flip-flop U113/U108 so U113 pin 11 is high (PRINT COMMAND) which is applied to pin 5 of U108 enabling that gate of the oscillator.

The input signal is applied to the integrator by U102 pins 1 and 2, and is connected by applying a positive signal to pin 13 from pin 11 of U114 which is an inverter and level shifter. The low signal of U114 pins 12 and 13 is at a TTL low level, obtained from U112 pin 10 which has a high level at pin 11 from U106 pin 11 having had its D output set high by the reset pulse from the sync divider.

At the end of 800 pulses a decision is made to change polarity to positive if the integrator output has gone positive. This is done by the comparator and the D output of the third decade counter U111 pin 11 acting on U108 pin 8. The comparator output pin 7 goes low for a positive signal input. This low signal applied to U112 pin 13 is inverted to a high at pin 12 which applied to pin 9 of U108 enables that gate. The decade counter U111 pin 11 is connected to pin 10 of U108 and enables that gate at a count of 800. Pin 11 of U108 is enabled during the first 1000 pulses only by U106 pin 11 so as to avoid further toggling when large signal inputs cause U111 to count through the state of 800 a second or third time.

Print Command

The print command flip-flop U113/U108 pin 11 is set high by U112 pin 10 low at the beginning of conversion. At the end of conversion the flip-flop will be turned off by signals at either pin 1 or pin 2 or U108 dependent on polarity of input signal, negative or positive respectively.

For a negative polarity U106 pin 12 is high U113 pin 2 is high and inverter U112 pin 6 is low and applied to U113 pin 4 causes U113 pin 6 to remain high making U102 pin 2 gate input ineffective. The comparator output is high during conversion, then at zero crossing goes low. This causes U112 pin 12 to go high which drives U113 pin 1 high allowing U113 pin 3 to go low and turn off the PRINT COMMAND FF by U108 pin 1.

For a postive polarity U113 pin 4 is held high by the polarity FF U106 pin 12 to the low state inverted by U112 pin 6. The comparator output is low during conversion, U112 pin 4 is low, and coupled to U113 pin 5 causes U113 pin 6 to remain high until zero crossing. At zero crossing, high comparator output causes U114 pin 4 to go high, U113 pin 5 is high, U113 pin 6 low, U108 pin 2 102 which terminates print command.

Reference Polarity

Reference voltage sources are turned on by gate U113 pin 8 in response to input pins 9 and 10 high. Pin 9 is enabled by PRINT COMMAND. Pin 10 is enabled at the end of 1000 counts by inverter U112 pin 10 which inverts the D signal of the switch counter C106 pin 11.

The choice of polarity of reference signal comes from the comparator, for a positive signal input the comparator output is low, U112 pin 12 is high disabling output of U114 pin 4. U112 pin 4 low enables U114 pin 3 to go high turning on the N signal which connects the negative reference voltage stored on C103.

For a negative input signal, comparator output is high, U112 pin 12 is low enabling U114 pin 4 which can turn on the R signal which connects the positive voltage reference of divider R117, R116, R115, R141, R142 via U102 pins 10 and 11.

BCD Outputs (Optional)

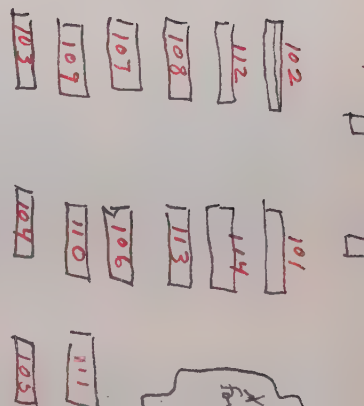
Binary - coded - decimal outputs are available from the decade counters with a 1 2 4 8 code using positive logic with standard TTL levels of 0.4 volts and 2.4 volts for the 0 and 1 state respectively. The drive is sufficient to sink two standard loads, 3.2mA, in the low state.

TABLE 3
RANGING COMPONENTS

BOARD ASSY	RANGE	C101	C111	C116	C117	R101	R102	R103	R142	R144
274721-901	100mV	-	Selected	269951-001	269951-001	-	-	-	-	Selected
274721-902	1V	270034-001	-	-	-	-	-	-	Selected	-
274721-903	10V	-	Selected	269953-001	269953-001	270197-001	270197-001	269884-001	-	Selected
274721-904	100V	-	Selected	269951-001	269951-001	270197-001	270197-001	269911-001	-	Selected
274721-905	1000V	-	Selected	269951-001	269951-001	270197-001	270197-001	270194-001	-	Selected
274721-906	10μA	-	Selected	269951-001	269951-001	-	-	266627-001	-	Selected
274721-907	100μA	-	Selected	269951-001	269951-001	-	-	266628-001	-	Selected
274721-908	1mA	-	Selected	269951-001	269951-001	-	-	264775-001	-	Selected
274721-909	10mA	-	Selected	269951-001	269951-001	-	-	264773-001	-	Selected
274721-910	100mA	-	Selected	269951-001	269951-001	-	-	264776-001	-	Selected

TABLE 4
COMPONENT DESCRIPTION

PART NUMBER	DESCRIPTION
264773-001	RESISTOR, 10 ohms ±1%, 2 Watts
264775-001	RESISTOR, 100 ohms ±1%, 2 Watts
264776-001	RESISTOR, 1 ohm ±1%, 2 Watts
266627-001	RESISTOR, 10k ohms ±1%, 1/8 Watt
266628-001	RESISTOR, 1k ohms ±1%, 1/8 Watt
269884-001	RESISTOR, 49.9k ohms ±1%, 1/8 Watt
269911-001	RESISTOR, 4.99k ohms ±1%, 1/8 Watt
269951-001	CAPACITOR, 15μF ±20%, 10 WVDC
269953-001	CAPACITOR, 2.2μF ±20%, 35 WVDC
270034-001	CAPACITOR, 0.68μF ±20%, 50 WVDC
270194-001	RESISTOR, 499 ohms ±1%, 1/8 Watt
270197-001	RESISTOR, 2.49M ohms ±1%, 3/4 Watt



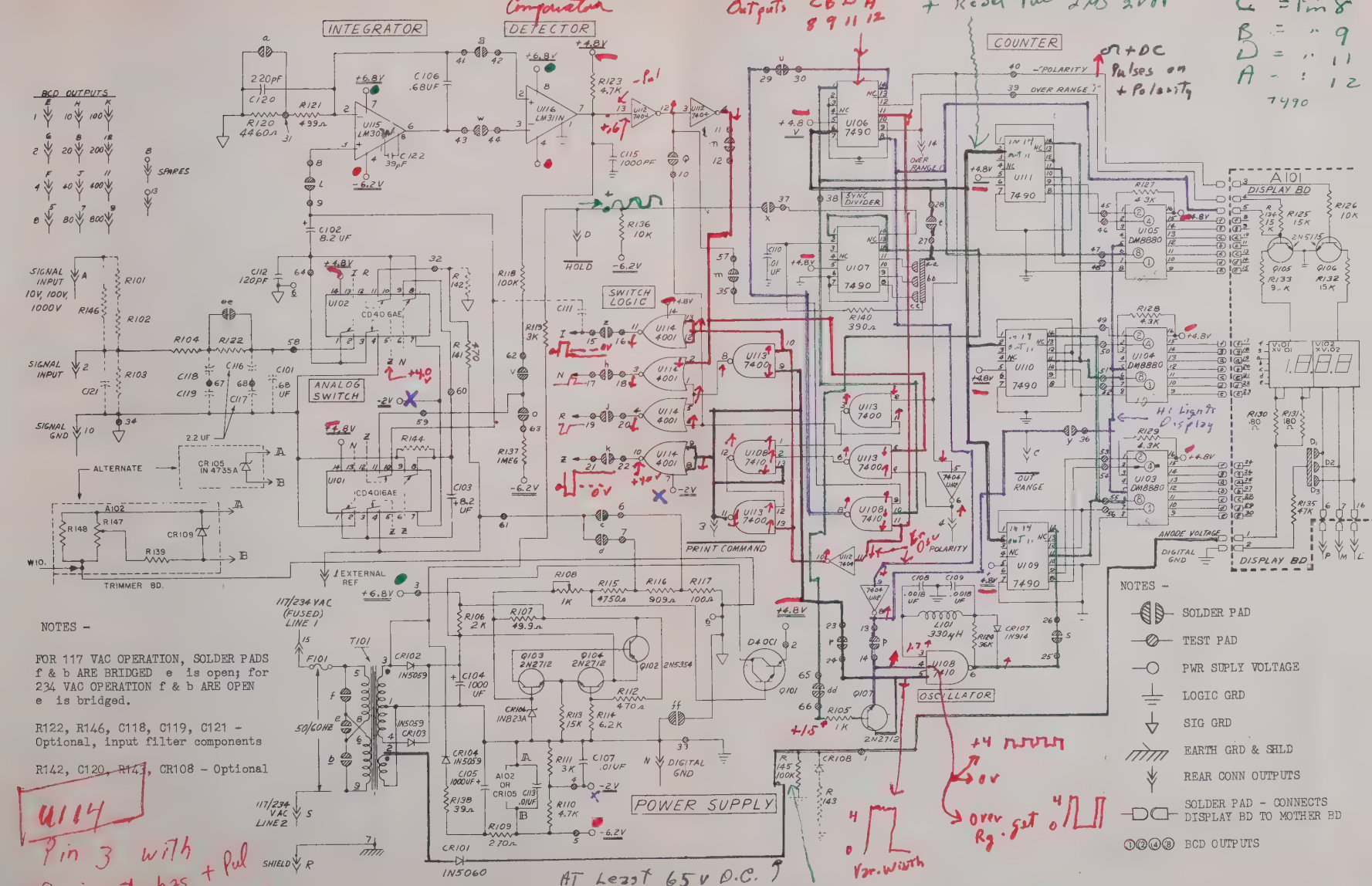


Figure 9. Schematic Diagram

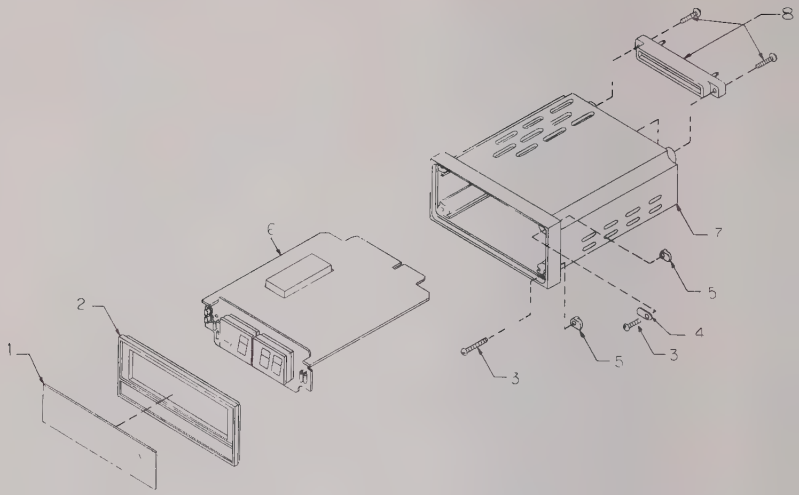
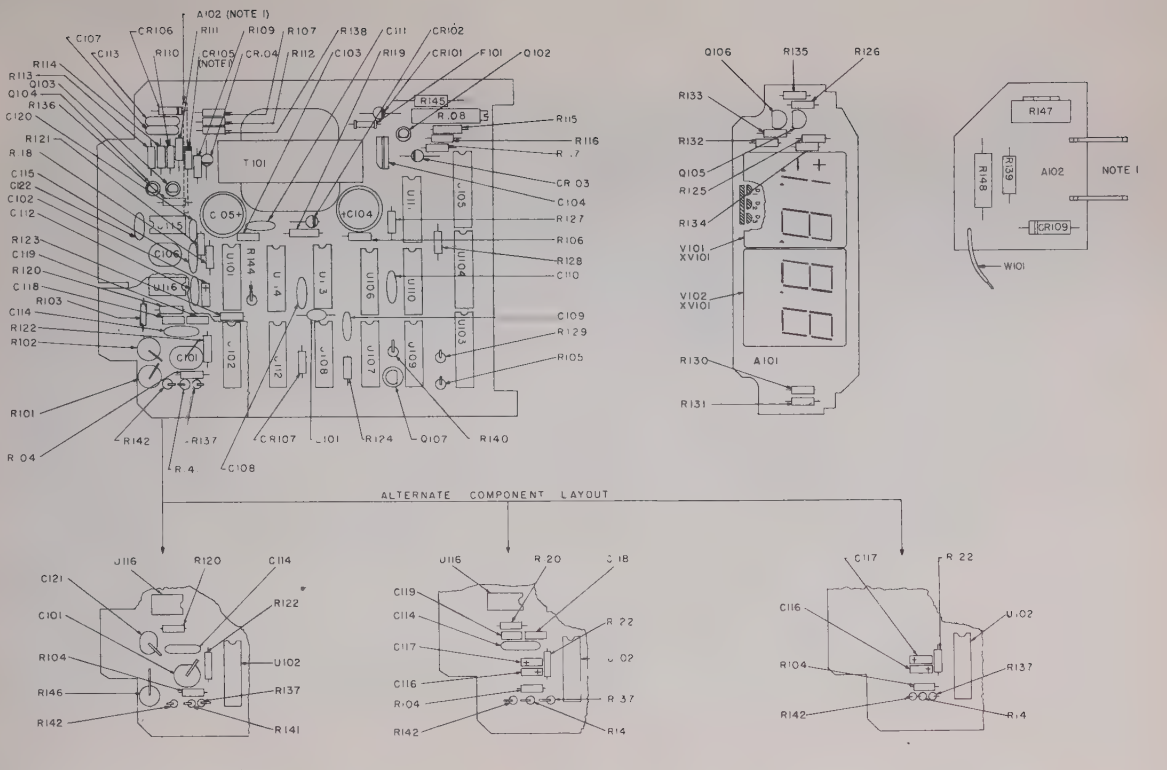


Figure 10. Assembly

ITEM NUMBER	DESCRIPTION	PART NUMBER
1	WINDOW, MILLIVOLTS	267371-901
1	WINDOW, VOLTS	267371-902
1	WINDOW, MICROAMPERES	267371-903
1	WINDOW, MILLIAMPERES	267371-904
2	FRONT	265657-901
3	SCREW	266623-045
4	CLAMP, CIRCUIT BOARD	265663-001
5	CLAMP, PANEL MTG	265661-024
6	BOARD ASSY (Ref Table 3)	—
7	CASE, With BCD	274774-903
7	CASE, Without BCD	274774-901
8	CONNECTOR PACKAGE (Per Order)	267253-901



NOTES. 1- A102 ALTERNATE TO CR105

Figure 11. Board Assembly

PARTS LIST

REFERENCE SYMBOL	DESCRIPTION	PART NUMBER
	BOARD ASSY (Ref Figure 11)	
A101	DISPLAY BOARD ASSY (See sep. list for details)	274711-901
A102	TRIMMER BOARD ASSY(See sep. list for details)	275727-902
C101	CAPACITOR (Ref Table 3)	—
C102	CAPACITOR, 8.2uF ±20%, 15WVDC	269952-001
C103	CAPACITOR, 8.2uF ±20%, 15WVDC	269952-001
C104	CAPACITOR, 1000uF +50%, -10%, 10WVDC	275631-001
C105	CAPACITOR, 1000uF +50%, -10%, 10WVDC	275631-001
C106	CAPACITOR, 0.68uF ±20%, 50WVDC	270034-001
C107	CAPACITOR, 0.01uF +80%, -20%, 50WVDC	269899-001
C108	CAPACITOR, 1800pF ±10%, 1000WVDC	275690-001
C109	CAPACITOR, 1800pF ±10%, 1000WVDC	275690-001
C110	CAPACITOR, 0.01uF +80%, -20%, 50WVDC	269899-001
C111	CAPACITOR (Ref Table 3)	—
C112	CAPACITOR, 120pF ±10%, 1000WVDC	264090-001
C113	CAPACITOR, 0.01uF +80%, -20%, 50WVDC	269899-001
C115	CAPACITOR, 1000pF ±10%, 1000WVDC	266417-001
C116	CAPACITOR (Ref Table 3)	—
C117	CAPACITOR (Ref Table 3)	—
*C118	CAPACITOR	—
*C119	CAPACITOR	—
C120	CAPACITOR, 220pF ±10%, 1000WVDC	264091-001
*C121	CAPACITOR	—
C122	CAPACITOR, 39pF ±5%, 300WVDC (for 1V range)	269949-001
CR101	DIODE, 1N5060	266591-001
CR102	DIODE, 1N5059	266611-001
CR103	DIODE, 1N5059	266611-001
CR104	DIODE, 1N5059	266611-001
CR105	DIODE, 1N4735A	264600-001
CR106	DIODE, 1N823A	ND60978-001
CR107	DIODE, 1N914	61025-001
*CR108	DIODE	—
F101	FUSE, 1/2 AMP, 125V	272753-001
L101	INDUCTOR, 330uH ±10%	274718-001
Q101	TRANSISTOR, D40C1	268797-001
Q102	TRANSISTOR, 2N5354	268795-001
Q103	TRANSISTOR, 2N2712	39917-001
Q104	TRANSISTOR, 2N2712	39917-001
Q107	TRANSISTOR, 2N2712	39917-001

*Optional - Not used on catalog instruments

REFERENCE SYMBOL	DESCRIPTION	PART NUMBER
	BOARD ASSEMBLY (Ref. figure 11 Continued)	
R101	RESISTOR (Ref Table 3)	—
R102	RESISTOR (Ref Table 3)	—
R103	RESISTOR (Ref Table 3)	—
R104	RESISTOR, 10k ohms ±5%, 1/4 Watt	264673-001
R105	RESISTOR, 1k ohms ±5%, 1/4 Watt	266612-001
R106	RESISTOR, 2k ohms ±5%, 1/4 Watt	272327-001
R107	RESISTOR, 49.9 ohms ±1%, 1/8 Watt	269886-001
R108	RESISTOR, VARIABLE, 1k ohms ±10%, 1 Watt	270162-001
R109	RESISTOR, 270 ohms ±5%, 1/4 Watt	272717-001
R110	RESISTOR, 4.7k ohms ±5%, 1/4 Watt	263652-001
R111	RESISTOR, 3k ohms ±5%, 1/4 Watt	269857-001
R112	RESISTOR, 470 ohms ±5%, 1/4 Watt	274196-001
R113	RESISTOR, 15k ohms ±5%, 1/4 Watt	263655-001
R114	RESISTOR, 6.2k ohms ±5%, 1/4 Watt	276361-001
R115	RESISTOR, 4750 ohms ±1%, 1/8 Watt	272238-001
R116	RESISTOR, 909 ohms ±1%, 1/8 Watt	272543-001
R117	RESISTOR, 100 ohms ±1%, 1/8 Watt	269925-001
R118	RESISTOR, 100k ohms ±5%, 1/4 Watt	266592-001
R119	RESISTOR, 3k ohms ±5%, 1/4 Watt	269857-001
R120	RESISTOR, 4460 ohms ±1%, 1/8 Watt	272216-001
R121	RESISTOR, 499 ohms ±1%, 1/8 Watt	270194-001
*R122	RESISTOR	—
R123	RESISTOR, 4.7k ohms ±5%, 1/4 Watt	263652-001
R124	RESISTOR, 36k ohms ±5%, 1/4 Watt	272207-001
R127	RESISTOR, 4.3k ohms ±5%, 1/4 Watt	266323-001
R128	RESISTOR, 4.3k ohms ±5%, 1/4 Watt	266323-001
R129	RESISTOR, 4.3k ohms ±5%, 1/4 Watt	266323-001
R137	RESISTOR, 1M ohms ±5%, 1/4 Watt	268782-001
R138	RESISTOR, 39 ohms ±5%, 1/4 Watt	274200-001
R140	RESISTOR, 390 ohms ±5%, 1/4 Watt	272246-001
R141	RESISTOR, 470 ohms ±5%, 1/4 Watt	274196-001
R142	RESISTOR (Ref Table 3)	—
*R143	RESISTOR	—
R144	RESISTOR (Ref Table 3)	—
R145	RESISTOR, 100k ohms ±5%, 1/2 Watt	264086-001
*R146	RESISTOR	—
T101	TRANSFORMER	274439-901
U101	INTEGRATED CIRCUIT, CD4016AE	274716-001
U102	INTEGRATED CIRCUIT, CD4016AE	274716-001
U103	INTEGRATED CIRCUIT, DM8880	274715-001
U104	INTEGRATED CIRCUIT, DM8880	274715-001
U105	INTEGRATED CIRCUIT, DM8880	274715-001

*Optional - Not used on catalog instruments

REFERENCE SYMBOL	DESCRIPTION	PART NUMBER
	BOARD ASSEMBLY (Ref. figure 11 Continued)	
U106	INTEGRATED CIRCUIT, 7490	272267-001
U107	INTEGRATED CIRCUIT, 7490	272267-001
U108	INTEGRATED CIRCUIT, 7410	272268-001
U109	INTEGRATED CIRCUIT, 7490	272267-001
U110	INTEGRATED CIRCUIT, 7490	272267-001
U111	INTEGRATED CIRCUIT, 7490	272267-001
U112	INTEGRATED CIRCUIT, 7404	272759-001
U113	INTEGRATED CIRCUIT, 7400	272264-001
U114	INTEGRATED CIRCUIT, 4001	274717-001
U115	INTEGRATED CIRCUIT, LM301A	272691-001
U116	INTEGRATED CIRCUIT, LM311N	274122-001
—	BOARD, DRILLED	274720-901
	DISPLAY BOARD ASSY (Ref Figure 11)	
Q105	TRANSISTOR, 2N5175	266585-001
Q106	TRANSISTOR, 2N5175	266585-001
R125	RESISTOR, 15k ohms ±5%, 1/4 Watt	263655-001
R126	RESISTOR, 10k ohms ±5%, 1/4 Watt	264673-001
R130	RESISTOR, 180 ohms ±5%, 1/4 Watt	ND20593-001
R131	RESISTOR, 180 ohms ±5%, 1/4 Watt	ND20593-001
R132	RESISTOR, 15k ohms ±5%, 1/4 Watt	263655-001
R133	RESISTOR, 9.1k ohms ±5%, 1/4 Watt	270121-001
R134	RESISTOR, 15k ohms ±5%, 1/4 Watt	263655-001
R135	RESISTOR, 47k ohms ±5%, 1/4 Watt	264676-001
V101	DISPLAY, NUMERIC, 1 1/2 Digit	274712-001
V102	DISPLAY, NUMERIC, 2 Digit	274713-001
XV101	SOCKET, DISPLAY	274714-001
XV102	SOCKET, DISPLAY	274714-001
—	BOARD, DRILLED	274710-901
	TRIMMER BOARD ASSY (Ref Figure 11)	
CR109	DIODE, 1N4735A	264600-001
R139	RESISTOR, 3.01k ohms ±1%, 1/8 Watt	272217-001
R147	RESISTOR, VARIABLE, 100 ohms ±20%, 0.2 Watt	276311-001
R148	RESISTOR, 0.24 ohms ±10%, 1 Watt	276324-001
W101	WIRE, HOOKUP	246374-942
—	BOARD, DRILLED	275728-901

WESTON EQUIPMENT WARRANTY

Weston warrants equipment of its manufacture against defective materials or workmanship for a period of one year from date of shipment.

The liability of Seller under this warranty is limited, at Seller's option, solely to repair, replacement with equivalent Weston equipment, at an appropriate credit adjustment not to exceed the original equipment sales price, of equipment returned to the Seller provided that (a) Seller is promptly notified in writing by Buyer upon discovery of defects, (b)Upon receipt of written authorization from Seller the defective equipment is returned as directed, transportation charges prepaid by Buyer, and (c) Seller's examination of such equipment discloses to his satisfaction that defects were not caused by negligence, misuse, improper installation, accident, or unauthorized repair or alteration by the Buyer.

This warranty does not include mechanical parts failing from normal usage nor does it cover limited life electrical components which deteriorate with age such as tubes, lamps, etc.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranty of fitness for a particular purpose to the original purchaser or to any other person. Seller shall not be liable for consequential damages of any kind.

The aforementioned provisions do not extend the original warranty period of any article which has been either repaired or replaced by Seller.

NOTES

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